1. Apparatus for vacuum encapsulation of a semiconductor chip package, comprising:

a dispense chamber having an inlet end, an outlet end and a material dispenser mounted therein operable to dispense encapsulant material about peripheral edges of a semiconductor chip package under at least partial vacuum of the dispense chamber during a dispense cycle;

an inlet chamber mounted adjacent the inlet end of said dispense chamber and isolatable therefrom, said inlet chamber including a transport mechanism operable to transfer a semiconductor chip package to the dispense chamber under at least partial vacuum of said inlet chamber and said dispense chamber;

an outlet chamber mounted adjacent the outlet end of said dispense chamber and isolatable therefrom, said outlet chamber including a transport mechanism operable to receive a semiconductor chip package onto which encapsulant material has been dispensed from said dispense chamber under at least partial vacuum of said outlet chamber and said dispense chamber; and

a vent connected to said outlet chamber for venting said outlet chamber to atmosphere, whereby upon venting said outlet chamber to atmosphere, the dispensed encapsulant material is forced

into the semiconductor chip package to form an encapsulation layer therein.

2. The apparatus of claim 1 further including a movable partition mounted between the inlet end of said dispense chamber and said inlet chamber for providing a substantially air-tight seal between said dispense chamber and said inlet chamber in a closed position of said movable partition.

3. The apparatus of claim 1 further including a movable partition mounted between the outlet end of said dispense chamber and said outlet chamber for providing a substantially air-tight seal between said dispense chamber and said outlet chamber in a closed position of said movable partition.

4. The apparatus of claim 1 wherein said dispense chamber includes a transport mechanism operable to receive a semiconductor chip package from said inlet chamber, move the semiconductor chip package through said dispense chamber, and transfer the semiconductor chip package to said outlet chamber.

5. The apparatus of claim 4 further including at least one controller for controlling independent operation of each of said transport mechanisms in said inlet, outlet and dispense chambers.

6. The apparatus of claim 1 further including a single vacuum pump fluidly connected to each of said inlet, outlet and dispense chambers to provide at least partial vacuum in each of said chambers.

7. The apparatus of claim 1 wherein said dispense chamber includes a dispense portion at which location said material dispenser is operable to dispense encapsulant material about peripheral edges of a semiconductor chip package, and a dwell portion at which location the semiconductor chip package onto which encapsulant material has been dispensed is permitted to dwell to allow the encapsulant material to generally flow into the semiconductor chip package.

8. The apparatus of claim 1 wherein said vent comprises an adjustable vent valve operable to control a vent rate of said outlet chamber to atmosphere.

9. Apparatus for vacuum encapsulation of a semiconductor chip package, comprising:

a dispense chamber having an inlet end, an outlet end and a material dispenser mounted therein operable to dispense encapsulant material about peripheral edges of a semiconductor chip package during a dispense cycle;

an inlet chamber mounted adjacent the inlet end of said dispense chamber and isolatable therefrom, said inlet chamber including a transport mechanism operable to transfer a semiconductor chip package to said dispense chamber;

an outlet chamber mounted adjacent the outlet end of said dispense chamber and isolatable therefrom, said outlet chamber including a transport mechanism operable to receive a semiconductor chip package onto which encapsulant material has been dispensed from said dispense chamber;

at least one vacuum pump fluidly connected to said inlet, outlet and dispense chambers for evacuating each of said chambers in a controlled manner, whereby said dispense station is evacuated, said inlet chamber is evacuated prior to the transfer of a semiconductor chip package to said dispense chamber, and said outlet chamber is evacuated prior to the receipt of a semiconductor chip package onto

which encapsulant material has been dispensed from said dispense chamber; and

a vent connected to said outlet chamber for venting said outlet chamber to atmosphere, whereby upon venting said outlet chamber to atmosphere, the dispensed encapsulant material is forced into the semiconductor chip package to form an encapsulation layer therein.

10. The apparatus of claim 9 wherein said dispense chamber includes a dispense portion at which location said material dispenser is operable to dispense encapsulant material about peripheral edges of a semiconductor chip package, and a dwell portion at which location the semiconductor chip package onto which encapsulant material has been dispensed is permitted to dwell to allow the encapsulant material to generally flow into the semiconductor chip package.

11. The apparatus of claim 10 wherein said vent comprises an adjustable vent valve operable to control a vent rate of said outlet chamber to atmosphere.

12. A method of encapsulating a semiconductor chip package, comprising:

evacuating a first chamber;

placing a semiconductor chip package into a second chamber at atmosphere;

evacuating the second chamber and moving the semiconductor chip package to the evacuated first chamber;

dispensing encapsulant material about peripheral edges of the semiconductor chip package in the evacuated first chamber;

evacuating a third chamber;

transporting the encapsulated semiconductor package from the first chamber into the evacuated third chamber; and

venting the third chamber to atmosphere to force the encapsulant material into the semiconductor chip package.

13. The method of claim 12 wherein the venting step includes venting the third chamber at an adjustable vent rate.

14. The method of claim 12 further comprising the step of holding the semiconductor chip package in the evacuated first chamber for a predetermined dwell period before transporting the semiconductor package from the evacuated first chamber to the evacuated third chamber.

15. The method of claim 14 further comprising the step of holding the semiconductor chip package in the evacuated third chamber for a predetermined dwell period prior to the evacuating the third chamber.

16. The method of claim 15 wherein the dwell periods in said dispense chamber and said outlet chamber are independently adjustable.

17. The method of claim 12 further comprising the step of fluidly connecting a single vacuum pump to each of the first, second and third chambers for evacuating each of the chambers.

18. A method of encapsulating a semiconductor chip package, comprising:

providing a first chamber having inlet and outlet ends;

mounting a second chamber adjacent the inlet end of the first chamber;

providing a movable partition between the first and second chambers for providing a substantially air-tight seal between the first and second chambers;

mounting a third chamber adjacent the outlet end of the first chamber;

providing a movable partition between the first and third chambers for providing a substantially air-tight seal between the first and third chambers;

closing the movable partitions between the first and second chambers and the first and third chambers;

evacuating the first chamber;

placing a semiconductor chip package into a second chamber at atmosphere;

evacuating the second chamber and moving the semiconductor chip package into the evacuated first chamber;

dispensing encapsulant material about peripheral edges of the semiconductor chip package in the evacuated first chamber;

evacuating the third chamber;

transporting the semiconductor package from the evacuated first chamber into the evacuated third chamber about which encapsulant material has been dispensed; and

venting the evacuated third chamber to atmosphere to force the encapsulant material into the semiconductor chip package.

19. The method of claim 18 further comprising the step of holding the semiconductor chip package in the evacuated first chamber for a predetermined dwell period before transporting the semiconductor package from the evacuated first chamber to the evacuated third chamber.

20. The method of claim 19 further comprising the step of holding the semiconductor chip package in the evacuated third chamber for a predetermined dwell period prior to the evacuating the third chamber.

21. The method of claim 20 wherein the dwell periods in said dispense chamber and said outlet chamber are independently adjustable.